

CLAIM OR CLAIMS

WE CLAIM:

1. A method for loading samples on a microarray which is formed of a plurality of sub-arrays on a common substrate, the method comprising the steps of
placing the samples to be loaded onto a sample loading array, the samples located on the sample loading array in physical alignment with the location of the sub-arrays on the microarray; and
placing the sample loading array in contact with the microarray under conditions so that molecules in the samples can hybridize to probes in the aligned sub-arrays.
2. A microarray hybridization chamber for parallel loading of samples comprising:
a sample loading array comprising a plurality of micro-channels having a first open end on a first side of the channel array and a second open end on a second side of the channel array, said first end and second end defining a channel in fluid communication with the first side of the channel array and the second side of the channel area, each channel having a longitudinal axis passing through its center and defining the center of the channel;
a microarray comprising a plurality of sub-arrays;
a membrane in contact with the second side of the channel array to close the second end of the micro-channels and to allow for the selective passing of liquids and molecules through the membrane and through the micro-channels; and
a gasket, the gasket being placed between the first side of the channel array and the microarray so as to provide a hybridization chamber, and wherein the center of the channels are aligned with the center of the sub-arrays.
3. The chamber of Claim 2 wherein the gasket is dual sided and semi-adhesive.
4. The chamber of Claim 2 wherein the sub-arrays are divided by a hydrophobic barrier.
5. The chamber of Claim 4 wherein the hydrophobic barrier comprises of a hydrophobic group-bearing phosphoramidite.
6. The chamber of Claim 5 wherein the hydrophobic group-bearing phosphoramidite is trityl protected phosphoramidite.

7. A method for loading in parallel at least one sample into a plurality of sub-arrays, the method comprising the steps of:

providing a sample loading array comprising a plurality of micro-channels having a first open end on a first side of the sample loading array and a second open end on a second side of the sample array, each channel having a longitudinal axis passing through its center and defining the center of the channel;

providing a microarray comprising a plurality of sub-arrays;

providing a membrane in contact with the second side of the sample loading array to close the second end of at least one micro-channel and to allow for the selective passing of liquids and molecules through the membrane and through the micro-channels;

depositing a sample in at least one micro-channel through its first open end; and

bringing the sample array into contact with the microarray to contact the samples placed in the micro-channels to the corresponding sub-array.

8. The method of Claim 7 wherein the samples are placed in contact with the subarray using either centrifugal force or pressure.

9. The method of Claim 7 wherein the samples are placed in contact with the subarray using a vacuum.

10. The method of Claim 7 wherein there is a gasket located between the sample loading array and the microarray.

11. The method of Claim 7 wherein the sub-arrays are divided by a hydrophobic barrier.

12. The method of Claim 11 wherein the hydrophobic barrier comprises of a hydrophobic group-bearing phosphoramidite.

13. The method of Claim 7 wherein the sample is deposited into the plurality of micro-channels using a delivery system capable of simultaneous delivery of samples to multiple sites.

14. A method for simultaneously hybridizing a microarray having multiple sub-arrays, the method comprising the steps of:

providing a first microarray which includes a plurality of sub-arrays;

depositing a sample for each sub-array on a planar sample loading array;

placing against the microarray a gasket to encompass the sub-arrays containing the sample; and

placing in contact with the gasket the sample loading array with each sample aligned with a one of the sub-arrays as to provide a sandwich hybridization chamber.

15. The method of Claim 14 wherein the sub-arrays are divided by a hydrophobic barrier.

16. The method of Claim 15 wherein the hydrophobic barrier is formed by a hydrophobic group-bearing phosphoramidite bound to the substrate.

17. The method of Claim 14 wherein the sample is deposited into a plurality of sub-arrays using a delivery system capable of simultaneous delivery of samples to multiple sites.

18. The method of Claim 14 wherein the delivery system is either a bundle of capillary tubes, a fluid handling robot, or a robot designed for manufacturing spotted arrays.